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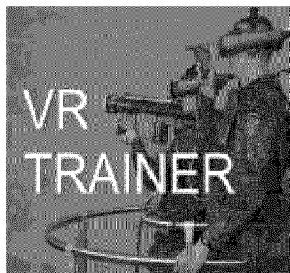
Advanced Air Defence Training Simulation System (AADTSS)

Virtual Reality is Reality in German Airforce Training

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This article describes the AADTSS simulation system and explains the reasons why it was realised with Virtual Reality technology.



The two team members need to communicate acoustically and optically. Because of the closed HMDs the students cannot see each other. This problem was solved by modelling the commander and the gunner as avatares.



The requirements

The programme started with the following main requirements:

- STINGER team training (commander, gunner)
- transportable, mobile
- size of scenarios: 360°×130°
- 8 targets, 8 effects, 2 missile firings at the same time
- long range aircraft detection and identification
- fast database generation system.

Why Virtual Reality?

As you can see, there are the contradictory requirements size of "scenario" and "transportable".

These requirements make it impossible to use a normal dome-display-system. The solution is Virtual Reality.

The technical solution

The AADTSS simulator is integrated in a container. Both, the commander and the gunner are wearing Head-Mounted-Displays (HMDs). Because of the requirement "long aircraft detection/identification", the resolution per eye is 1280×1024 pixels. The HMDs are without a see-through-option, because of the better contrast and the advantage, that there is no need to switch of the lights in the container.

This solution might be a little bit funny, but it is well accepted by the soldiers.

The commander is tracked by an inertial tracking system, the gunner is tracked by an optical tracking system. Magnetic tracking systems are not suitable for use in environments like containers made of metal. Orientation rings for the commander and the gunner are integrated in the container. This solution is necessary because of the HMDs without see-through-option.

Database generation system

The generation of databases is based on stereoscopic photos. It allows the generation of scenarios, targets and flight paths and is independent of the simulator. It consists of one workstation, the stereo-camera-system and one control-PC.

The main advantage of this system is, that there is no need for geographical data like maps or DTED and DFAD data.

Milestones

- | | |
|-----------|---------------------|
| • 04/1995 | First requirement |
| • 11/1997 | Troop trial unit |
| • 05/1999 | Final configuration |